

DOCUMENT RESUME

ED 380 489

TM 022 849

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TITLE Concurrent Validity of Scores from the Hendrick-Hendrick "Love Attitudes Scale": Predicting Score Variance Using Androgyny Sex-Roles Data.
PUB DATE Jan 95
NOTE 26p.; Paper presented at the Annual Meeting of the Southwest Educational Research Association (Dallas, TX, January 27, 1995).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *College Students; *Concurrent Validity; Higher Education; Interpersonal Relationship; *Love; Multivariate Analysis; *Sex Role; Statistical Analysis; *Student Attitudes
IDENTIFIERS *Bem Sex Role Inventory; Eigenvalues; *Hendrick Hendrick Love Attitudes Scale

ABSTRACT

Love is among the most fundamental aspects of the experience of being human. Achieving successful love relationships has been associated by counselors--both counseling theories and researchers--with good mental and good physical health. Yet our knowledge of the nature of love remains primitive, because until recently it was not considered scientifically respectable to investigate love phenomena. The present study explored the nature of perceptions of love in relation to sex-role preferences measured by the Bem Sex-Role Inventory. The concurrent validity of scores on the Hendrick-Hendrick Love Attitudes Scale was investigated. Subjects were 791 graduate and undergraduate university students. Various bivariate and multivariate methods were used to explore these relationships. Results for the various subscales provide insight into the nature and dynamics of love. Four tables. Two appendixes list analysis eigenvalues and the instrument's varimax-rotated structure. (Contains 39 references.) (SLD)

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lovesera.wp1 1/22/95

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Concurrent validity of scores from
the Hendrick-Hendrick Love Attitudes Scale:
Predicting score variance using androgyny sex-roles data

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ABSTRACT

Love is among the most fundamental aspects of the experience of being human. Achieving successful love relationships has been associated by counselors--both counseling theorists and researchers--with good mental and even good physical health. Yet our knowledge of the nature of love remains primitive, because until recently it was not considered scientifically respectable to investigate love phenomena. The present study explored the nature of perceptions of love in relation to sex-role preferences measured by the *Bem Sex-Role Inventory*. Subjects were 791 graduate and undergraduate university students. Various bivariate and multivariate methods were used to explore these relationships.

Concurrent validity of scores from
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Love is among the most fundamental aspects of the experience of being human. Freud (1924) himself argued that, "A strong ego is protection against disease, but in the last resort we must begin to love in order that we may not fall ill, and we must fall ill if, in consequence of frustration, we cannot love" (p. 42). Similarly, Sternberg and Grajek (1984) noted that

Love can be among the most intense of human emotions, and is certainly one of the most sought after. People have been known to lie, cheat, steal, and even kill in its name, yet no one knows quite what it is. (p. 320)

And the nature of love remains of interest to persons other than academics and therapists, if the popular press is any indication (cf. "Finding Out", 1992; Gray, 1993).

Unfortunately, previous empirical research provides limited understanding of love phenomena, because historically researchers have presumed that love is too mysterious and too intangible for scientific study (Wrightsmann & Deaux, 1981). However, as C. Hendrick and S. Hendrick (1986) noted, more recently love has again become respectable as an area of study. Work by Rubin (1984) and by Tennov (1979) illustrates efforts to develop science in this area of inquiry. Two distinct traditions have emerged in contemporary research regarding love phenomena, as summarized by Thompson and Borrello (1992a).

Of these two traditions, the series of studies of interest in the present inquiry involves the deductively-grounded work (Borrello & Thompson, 1990a, 1990b; C. Hendrick & S. Hendrick, 1986, 1989, 1990; C. Hendrick, S. Hendrick, Foote & Slapion-Foote, 1984; S. Hendrick & C. Hendrick, 1987a, 1987b; Thompson & Borrello, 1987b, 1990, 1992b) that invokes Lee's (1973/1976) theoretical typology of love. These studies have employed one of the versions of the Love Attitudes Scale developed by the Hendricks.

The Hendrick-Hendrick instrument uses seven items to measure attitudes regarding each of the six love styles factors conceptualized by Lee (1973/1976), and presumed by the Hendricks in their exploratory factor analytic work to be uncorrelated. This particular general theory posits three primary love styles: (a) **eros**, which is romantic or passionate love, (b) **ludus**, which is game playing love, and (c) **storge**, which is friendship love. Lee suggested that three secondary styles are formed as compounds of the primary styles, but still have their own unique properties and characters: (d) **mania**, which is a compound of ludus and eros, (e) **pragma**, which is a compound of storge and ludus, and (f) **agape**, which is a compound of eros and storge.

The Hendrick-Hendrick measure has become increasingly popular. However, it is not entirely clear that the measure operationalizes a definition of love that social scientists should unequivocally accept (Rotzien, Vacha-Haase, Murthy, Davenport, & Thompson, 1994).

The purpose of the present study was to investigate the concurrent validity of scores on the Hendrick-Hendrick (1990)

measure. We employed the Bem Sex Role Inventory (BSRI; Bem, 1981) as a measure of androgyny in the present study to explore relationships between preferred love styles and androgyny. The measurement characteristics of BSRI scores have been investigated in previous studies (cf. Thompson, 1989; Thompson & Melancon, 1986, 1988).

The development of the *Bem Sex-Role Inventory* can be traced to Constantinople (1973), who argued that persons could possess stereotypically masculine and stereotypically feminine psychological traits in any combination, regardless of physical gender. For example, persons who are both masculine and feminine in their psychological outlook are termed "androgynous".

Our expectations in the present study were grounded in two lines of limited previous research. First, studies in which differences in means on the six love styles were computed across physical gender may provide some insights, though it must be remembered that sex-role preferences are psychological constructs not necessarily always bounded by physical gender. In one study involving 689 student subjects the greatest differences in means across physical gender occurred on Ludus, Pragma and Storge (C. Hendrick & S. Hendrick, 1988, p. 175). In a second study involving 204 undergraduate subjects the greatest differences in means across physical gender involved Ludus and Storge (C. Hendrick & S. Hendrick, 1988, p. 172).

Second, correlational studies predicting love styles preferences may also provide some basis for formulating

expectations. For example, in one study involving 234 persons constituting unmarried dating couples, Eros, Ludus and Agape were most predictable (mean r^2 values roughly 10%) from relationship ratings across diverse criteria such as commitment, intimacy, passion and satisfaction (Levy & Davis, 1988, p. 454). Also, Ludus was most related ($r=.24$) to a Dominating approach to conflict (Levy & Davis, 1988, p. 456).

These findings converge in supporting an expectation that BSRI masculine and feminine scores may be most related to Ludus. These previous results also suggest that BSRI scores may be somewhat predictive of variance on Storge, Eros and Agape as well.

Method

Subjects

In the present study we used data provided by 791 graduate and undergraduate students enrolled at a large university. The sample was predominantly white (82.9%), though the sample also included Hispanics (9.5%), and African-Americans (4.2%). There were slightly more women (50.9%) in the sample. The mean age was 20.23 ($SD=4.04$).

Results

Preliminary Measure Analyses: Reliability

Too few researchers act on a conscious recognition that *reliability is a characteristic of scores or the data in hand, and not of a test per se*. As Rowley (1976, p. 53, emphasis added) argued, "It needs to be established that an instrument itself is

neither reliable nor unreliable.... A single instrument can produce scores which are reliable, and other scores which are unreliable." Similarly, Crocker and Algina (1986, p. 144, emphasis added) argued that, "...A test is not 'reliable' or 'unreliable.' Rather, reliability is a property of the scores on a test for a particular group of examinees."

In another widely respected text, Gronlund and Linn (1990, p. 78, emphasis in original) noted,

Reliability refers to the results obtained with an evaluation instrument and not to the instrument itself.... Thus, it is more appropriate to speak of the reliability of the "test scores" or of the "measurement" than of the "test" or the "instrument."

As Pedhazur and Schmelkin (1991, p. 82, emphasis in original) observed, "Statements about the reliability of a measure are... inappropriate and potentially misleading." As noted elsewhere, our habit of telegraphic misspeaking when we say "the test is reliable"

...is not just an issue of sloppy speaking--the problem is that sometimes we unconsciously come to think what we say or what we hear, so that sloppy speaking does sometimes lead to a more pernicious outcome, sloppy thinking and sloppy practice.

(Thompson, 1992, p. 436)

Thompson (1994a, p. 840) explains the consequences:

The failure to consider score reliability in

substantive research may exact a toll on the interpretations within research studies. For example, we may conduct studies that could not possibly yield noteworthy effect sizes, given that score reliability inherently attenuates effect sizes. Or we may not accurately interpret the effect sizes in our studies if we do not consider the reliability of the scores we are actually analyzing.

Table 1 presents coefficients from a reliability analysis of scores on the six love-styles scales. Table 2 presents comparable data for summated scale scores on the BSRI.

INSERT TABLES 1 AND 2 ABOUT HERE.

Substantive Analyses

We computed summated scale scores on the six scales of the Hendrick-Hendrick measure and on the two BSRI scales by adding item responses on each scale. We also computed regression factor scores on a two-factor varimax factor structure from the BSRI, to explore invariance of results across two scoring strategies. Table 3 presents the bivariate product-moment correlation coefficients among pairs of these various scores.

INSERT TABLE 3 ABOUT HERE.

We also conducted multivariate concurrent validity analyses using canonical correlation analysis of the Table 3 correlation

coefficients (Thompson, 1984, 1991). We employed multivariate methods to avoid inflating experimentwise Type I error and to honor the complexities of the phenomena we were studying (Thompson, 1994b).

Table 4 presents the relevant coefficients for the analysis involving summated scale scores on both measures. The lambda prior to the extraction of the first canonical function was statistically significant ($\lambda=.77$, $F=18.17$, $df=12/1,566$, $p<.001$). The second lambda after the extraction of the first canonical function was also statistically significant ($\lambda=.92$, $F=14.30$, $df=5/784$, $p<.001$).

INSERT TABLE 4 ABOUT HERE.

Table 5 presents the relevant coefficients for the analysis involving summated scale scores on the Hendrick-Hendrick love styles measure and factor scores on the BSRI. The lambda prior to the extraction of the first canonical function was statistically significant ($\lambda=.75$, $F=20.58$, $df=12/1,566$, $p<.001$). The second lambda after the extraction of the first canonical function was also statistically significant ($\lambda=.91$, $F=15.47$, $df=5/784$, $p<.001$).

INSERT TABLE 5 ABOUT HERE.

Discussion

The analyses reported in Tables 1 and 2 suggest that scores from the two measures were adequate for the purposes of substantive analyses. However, reliability of scores from the love styles measure were generally smaller than the coefficients for BSRI

scores, and some love styles coefficients were marginal.

Nevertheless, as reported in Table 3, Ludus was best predicted from BSRI scores. Ludus scores were moderately correlated with both the BSRI summated Feminine scale scores ($r = +.2951$) and the BSRI Feminine factor scores ($r = +.3064$). Ludus scores were also somewhat correlated with both the BSRI summated Masculine scale scores ($r = -.1811$) and the BSRI Masculine factor scores ($r = -.1538$). These results were consistent with our prior expectations.

It is interesting that higher Feminine scores were positively associated with higher Ludus scores, while higher Masculine scores were associated with lower Ludus scores. Ludus is "game playing" love. BSRI Feminine scores are associated with higher item scores on variables such as Affectionate, Sympathetic, Sensitive. Ludus is an emotional love that tests the boundaries of game playing, but must be played with care that these boundaries are not violated. Otherwise, love partners will be damaged in *Dangerous Liaisons* fashion.

Feminine scores tended to be more associated with all six love styles scores than were BSRI Masculine scores, as reported in Table 3. It appears that the emotional and connected features of Feminine are related, either directly or inversely, to all the various styles of love.

These results are generally consistent with the multivariate analyses reported in Tables 4 and 5. The divergent findings for the two BSRI scales were reflected in the fact that Feminine scores

were predominantly associated with Function I, while Masculine scores were predominantly associated with Function II, as reflected in the squared structure coefficients for these BSRI scales.

The superior predictive ability of Feminine scores was reflected in the larger squared canonical correlation coefficients for the functions with which the Feminine scores were most associated ($R_c^2 = 15.93\%$ and 18.03%). Feminine scores were most predictive of variation in Ludus, as reflected in the disproportionately large squared structure coefficients on both Function I's (i.e., 60.58% and 60.63%). However, all love styles except Pragma ($r_s^2 = 5.89\%$ and 5.15%) tended to have large squared structure coefficients on Function I.

Apparently, all love styles but Pragma are related to elements of Sensitive, Sympathetic, Compassionate and Warm and other aspects of BSRI Feminine scores. These elements have connotations of interpersonal connection and emotion that logically might be related to these love styles.

BSRI Masculine scores were somewhat less related to the love styles scores, as reflected in the squared canonical correlation coefficients for the two Function II's ($R_c^2 = 8.36\%$ and 8.98%). The squared structure coefficients for the love styles on Function II indicate that higher Masculine scores were most related to lower scores on Eros and Pragma.

The BSRI items measuring Masculine focus on elements such as Leadership, Assertive, and Strong Personality. The inverse relationships between Eros and Pragma with Masculine may occur

because sexual and/or pragmatic relationships may be more likely to be cooperative and egalitarian.

The present study provides yet one more set of insights regarding the nature and dynamics of love. Understanding love is important if counselors and others are to facilitate the healthy functioning of people, as noted earlier. But as S. Hendrick and C. Hendrick (1992, p. 87) noted, "...it is certainly wisest in this relatively early stage of love research to keep an open theoretical mind when considering the complex phenomenon of love."

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Table 1
Statistics from Reliability Analysis
of the Hendrick-Hendrick Measure

Item/ Scale	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM- TOTAL CORRELATION	α IF ITEM DELETED
<i>Eros</i>				
E0101	15.6635	29.3306	.3100	.6623
E0210	16.8416	28.4518	.5388	.6025
E0313	16.6787	28.6904	.4092	.6322
E0419	16.3636	28.3564	.4441	.6225
E0525	15.7319	30.4860	.2071	.6968
E0631	16.4574	29.3658	.4242	.6296
E0737	16.5436	28.7186	.4235	.6284
$\alpha =$	0.6745			
<i>Ludus</i>				
L0802	30.4654	47.8266	.5072	.6969
L0907	30.3844	49.3772	.4856	.7025
L1014	29.8119	47.0587	.5624	.6838
L1122	29.8388	52.9757	.4206	.7176
L1226	30.8312	47.7151	.4269	.7191
L1334	31.7979	52.7205	.3445	.7338
L1438	29.5641	51.5249	.4480	.7115
$\alpha =$	0.7405			
<i>Storge</i>				
S1503	17.3263	50.6846	.2749	.7818
S1611	18.7887	52.4518	.3155	.7674
S1715	19.1161	52.2571	.2949	.7719
S1820	17.6041	39.6816	.6996	.6841
S1927	17.7704	41.9516	.6514	.6984
S2032	18.5489	48.5366	.4546	.7433
S2139	18.2552	41.7418	.7241	.6837
$\alpha =$	0.7659			
<i>Pragma</i>				
P2204	25.7364	58.1184	.4796	.7600
P2308	25.9695	61.3321	.4292	.7686
P2416	26.6147	62.4011	.4025	.7732
P2523	26.0402	55.9030	.6076	.7332
P2628	26.3828	59.1587	.4773	.7598
P2735	25.4511	56.8218	.6059	.7345
P2840	25.0023	58.4396	.5452	.7465
$\alpha =$	0.7816			
<i>Mania</i>				
M2905	25.4251	41.5412	.3672	.6504
M3012	22.9379	47.4256	.2627	.6731
M3117	25.2720	41.7149	.4217	.6333
M3221	24.9391	40.5455	.4976	.6117
M3329	24.4480	43.3646	.4105	.6376
M3433	25.9163	43.0523	.3428	.6562
M3541	24.7723	41.6630	.4071	.6375
$\alpha =$	0.6781			

<i>Agape</i>				
A3606	19.0171	48.4643	.3880	.7984
A3709	17.9604	41.3905	.5636	.7691
A3818	16.7002	40.3149	.5509	.7714
A3924	17.2223	41.5240	.5684	.7684
A4030	17.3879	40.2888	.4983	.7834
A4136	18.2665	44.0548	.4659	.7862
A4242	17.4797	36.2065	.7056	.7381
$\alpha =$	0.8006			

Table 2
Statistics from Reliability Analysis of the BSRI

Item/ Scale	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM- TOTAL CORRELATION	α IF ITEM DELETED
<i>Masculine</i>				
DEFENDMY	95.5759	203.5698	.4128	.8464
INDEPEND	96.0045	201.1258	.4346	.8453
ASSERTIV	96.8932	192.0807	.5800	.8390
STRONGPE	96.0323	195.7801	.5442	.8411
FORCEFUL	98.5417	198.6826	.3458	.8488
LEADERSH	96.1599	193.0220	.6011	.8387
TAKERISK	96.9020	195.2455	.4873	.8427
DOMINANT	97.5430	190.5834	.5399	.8401
TAKESTAN	96.2750	194.4040	.5708	.8400
AGRESSIV	97.6340	190.3296	.5238	.8408
SELFRELI	95.9604	200.9090	.4499	.8449
ATHLETIC	96.7263	194.3257	.3855	.8477
ANALYTIC	96.8263	205.8531	.1746	.8562
DECIEASY	97.4972	194.4417	.4274	.8453
SELSUFF	96.1843	200.2165	.4249	.8454
INDIVIDU	96.1896	203.6621	.3119	.8493
MASCULIN	97.9212	193.0514	.2650	.8604
COMPETIT	96.3579	192.2336	.5083	.8416
AMBITIOU	95.8225	200.0352	.4827	.8439
ASLEADER	96.5696	191.4986	.6070	.8380
$\alpha = 0.8515$				
<i>Feminine</i>				
AFFECTIO	93.3481	168.9484	.4835	.7959
SYMPATHE	93.4429	164.3345	.6167	.7894
SENSITIV	93.4214	164.9673	.6014	.7902
UNDERSTA	93.1218	169.4452	.5596	.7944
COMPASSI	93.3358	165.7174	.6249	.7902
SOOTHEHU	93.2760	165.7657	.5413	.7925
WARM	93.4391	164.9335	.6502	.7890
TENDER	93.7577	161.3877	.6752	.7856
LOVECHIL	93.3253	168.4168	.3425	.8022
GENTLE	93.5870	161.9564	.6965	.7855
YIELDING	94.6904	171.2475	.3504	.8016
CHEERFUL	93.5377	172.1236	.3786	.8006
SHY	95.2254	176.2676	.1245	.8164
FLATTERA	94.3549	174.6288	.1946	.8106
LOYAL	92.8017	175.5543	.3155	.8036
SOFTSPOK	95.1447	171.2480	.2266	.8105
GULLIBLE	95.7920	170.5726	.2774	.8063
CHILDLIK	95.3822	179.3195	.0620	.8197
NOHARSH	95.0598	166.9149	.2817	.8083
FEMININE	95.0359	158.2914	.3314	.8100
$\alpha = 0.8084$				

Table 3
Bivariate Correlation Coefficients

Variable	Variable									
	EROS	LUDUS	STORGE	PRAGMA	MANIA	AGAPE	BEMMASC	BEMFEMI	BEMFS1	BEMFS2
EROS	1.0000	-.2713**	.0589	.0553	.2679**	.4563**	-.0917**	-.2267**	-.1123**	-.2845**
LUDUS	-.2713**	1.0000	-.2165**	.0535	-.0968**	-.4077**	-.1811**	.2951**	-.1538**	.3064**
STORGE	.0589	-.2165**	1.0000	.1856**	.0641	.2330**	.0441	-.1869**	.0281	-.1971**
PRAGMA	.0553	.0535	.1856**	1.0000	.1501**	.0529	-.1227**	-.1212**	-.1384**	-.1258**
MANIA	.2679**	-.0968**	.0641	.1501**	1.0000	.4021**	.1149**	-.2230**	.1181**	-.1995**
AGAPE	.4563**	-.4077**	.2330**	.0529	.4021**	1.0000	.0183	-.2381**	.0181	-.2590**
BEMMASC	-.0917**	-.1811**	.0441	-.1227**	.1149**	.0183	1.0000	-.2018**	.9700**	-.0647
BEMFEMI	-.2267**	.2951**	-.1869**	-.1212**	-.2230**	-.2381**	-.2018**	1.0000	-.1801**	.9371**
BEMFS1	-.1123**	-.1538**	.0281	-.1384**	.1181**	.0181	.9700**	-.1801**	1.0000	.0000
BEMFS2	-.2845**	.3064**	-.1971**	-.1258**	-.1995**	-.2590**	-.0647	.9371**	.0000	1.0000

Note. "BEMFS1" and "BEMFS2" are factor scores on the two dimensions of the BSRI, respectively Masculine and Feminine.

* $p < .05$ ** $p < .01$ (2-tailed)

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Table 4
Canonical Correlation Analysis Coefficients

Variable	Function I			Function II			h ²
	Func	Struc	Stru ²	Func	Struc	Stru ²	
Eros	-0.203	-0.508	25.77%	0.705	0.600	35.96%	61.73%
Ludus	0.640	0.778	60.58%	0.493	0.268	7.20%	67.78%
Storge	-0.263	-0.465	21.65%	0.005	0.076	0.58%	22.24%
Pragma	-0.153	-0.243	5.89%	0.566	0.578	33.35%	39.24%
Mania	-0.431	-0.580	33.60%	-0.458	-0.126	1.59%	35.19%
Agape	0.018	-0.578	33.42%	0.262	0.230	5.27%	38.70%
Adequacy			30.15%			13.99%	
Rd			4.80%			1.17%	
Rc2			15.93%			8.36%	
Rd			8.75%			3.77%	
Adequacy			54.92%			45.08%	
Masculine	-0.156	-0.349	12.18%	-1.009	-0.937	87.82%	100.00%
Feminine	0.957	0.988	97.67%	-0.356	-0.153	2.33%	100.00%

canlove1.wk1 1/20/95

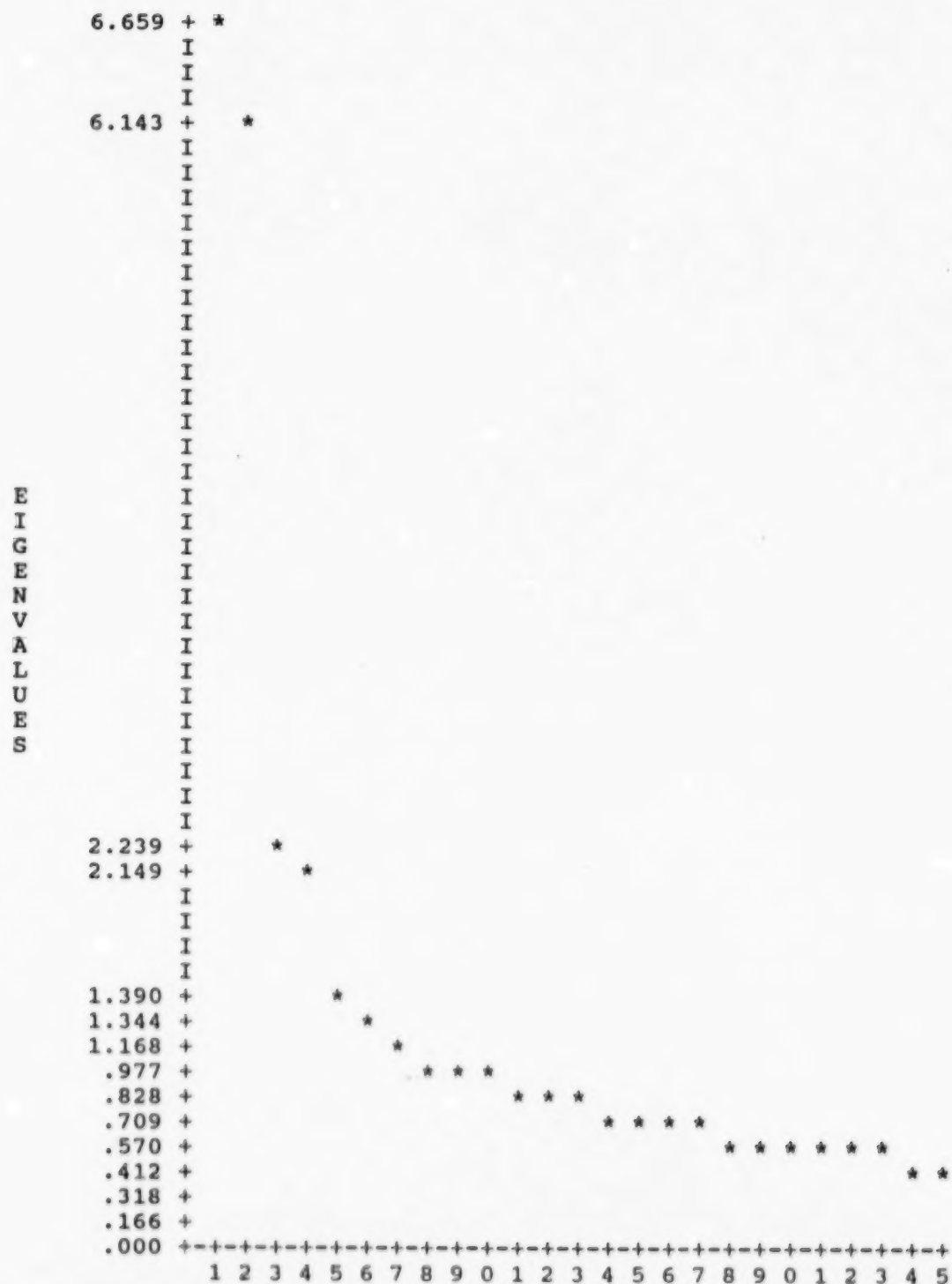
Table 5
Canonical Correlation Analysis Coefficients

Variable	Function I			Function II			h ²
	Func	Struc	Stru ²	Func	Struc	Stru ²	
Eros	-0.326	-0.605	36.65%	0.725	0.553	30.59%	67.24%
Ludus	0.604	0.779	60.63%	0.486	0.303	9.20%	69.83%
Storge	-0.269	-0.468	21.93%	-0.007	0.037	0.13%	22.06%
Pragma	-0.142	-0.227	5.15%	0.544	0.535	28.62%	33.77%
Mania	-0.327	-0.515	26.55%	-0.554	-0.256	6.56%	33.11%
Agape	-0.010	-0.607	36.80%	0.173	0.110	1.20%	38.00%
Adequacy			31.28%			12.72%	
Rd			5.64%			1.14%	
Rc2			18.03%			8.98%	
Rd			9.01%			4.49%	
Adequacy			50.00%			50.00%	
FScrMasc	-0.196	-0.196	3.82%	-0.981	-0.981	96.18%	100.00%
FScrFemi	0.981	0.981	96.18%	-0.196	-0.196	3.82%	100.00%

canlove2.wk1 1/20/95

Note. "FScrMasc" and "FScrFemi" are factor scores for the BSRI.

Appendix A
Scree Plot of Eigenvalues From BSRI Analysis



Appendix B
Varimax-Rotated Structure for the BSRI

DEFENDMY	.51010	.11448
INDEPEND	.49531	-.05453
ASSERTIV	.68703	-.01610
STRONGPE	.66821	.09218
FORCEFUL	.39830	-.20053
LEADERSH	.70082	.14259
TAKERISK	.53476	-.08704
DOMINANT	.61712	-.17533
TAKESTAN	.65613	-.00569
AGRESSIV	.59427	-.16643
SELFRELI	.50611	.05991
ATHLETIC	.41593	.01261
ANALYTIC	.18657	.03589
DECIEASY	.47793	-.05531
SELSUFF	.47989	.12581
INDIVIDU	.37775	.12969
MASCULIN	.27500	-.37796
COMPETIT	.53269	-.11112
AMBITIOU	.58110	.23182
ASLEADER	.71331	.10744
AFFECTIO	.04478	.64475
SYMPATHE	-.15301	.70145
SENSITIV	-.10825	.71376
UNDERSTA	.02279	.67431
COMPASSI	.01258	.76330
SOOTHEHU	.04808	.67812
WARM	.06693	.77428
TENDER	-.06714	.77810
LOVECHIL	.10653	.45057
GENTLE	-.07515	.76765
YIELDING	-.17210	.36960
CHEERFUL	.23911	.49205
SHY	-.42565	.04703
FLATTERA	.08571	.23605
LOYAL	.15870	.40605
SOFTSPOK	-.43213	.16438
GULLIBLE	-.26599	.22473
CHILDLIK	.03118	.05503
NOHARSH	-.16090	.30836
FEMININE	-.20146	.46220